PROPERTY PLANNING COMMON ELEMENTS

COMPONENTS OF MASTER PLANS

HABITATS AND THEIR MANAGEMENT

Coldwater Streams

Description

This page covers management of coldwater streams. These are described as flowing waters with maximum summer temperatures typically below 22 degrees Celsius (72 degrees Fahrenheit). The watersheds of these streams are usually less than 100 square miles, and the streams exhibit mean annual flow rates of less than 50 cubic feet per second. Coldwater streams can be found statewide but are concentrated in the southwest and in parts of central and northern Wisconsin. Streams in the unglaciated Driftless Area of the southwest exhibit a classic branched pattern and sharper, more eroded terrain. The rest of the state, smoothed by glaciers, has less topographic relief, creating sinuous streams with less average elevation drop.

Coldwater streams are dominated by groundwater inputs and sustain fish communities adapted to cold, oxygen-rich, flowing water conditions. These communities contain relatively few fish species and are dominated by trout and sculpins. Important coldwater species include game species like brook trout, brown trout, and rainbow trout, as well as species such as white sucker, mottled sculpin and various minnow species. Coldwater streams will often support diverse communities of invertebrates as well as environmentally sensitive mayflies, stoneflies and caddis flies.

Coldwater streams often rely on external sources of energy for the aquatic food web. Small streams are often shaded by trees and grasses so the invertebrates are adapted to eating leaves and detritus from terrestrial sources. Management of the streamside vegetation can increase productivity by allowing sunlight to penetrate directly into the stream to increase the production of algae and phytoplankton. This increases the invertebrate and fish populations, while balancing the need to remain sufficiently cold to sustain trout populations.

The physical habitat of a trout stream can be quite variable and is generally determined by watershed and landscape characteristics, specifically soils and geologic parent material as well as watershed size and gradient. Larger, lower-gradient streams are often sinuous and have bottom material composed of fine grained sands and silts. Smaller higher-gradient streams tend to be characterized by riffles and runs with gravel and rock substrate.

The quality of coldwater stream habitats and their fisheries can vary widely across the state, and not every stream needs the same type or intensity of management. In-stream and riparian habitats and the health of trout populations should be assessed for coldwater streams and used to classify them into three categories for habitat management purposes: protection; angler enhancement; and rehabilitation. Many coldwater streams, particularly in the extensively forested northern part of the state, are high-quality, healthy systems. The goal for these streams is to protect and maintain existing conditions, so management of these is primarily passive, with limited active management to address any fish passage impairments. Some streams require management primarily to enhance angler access and fishing conditions. In these cases, manipulation of riparian vegetation (e.g., brushing) may be applied, as well as streambank practices such as bank sloping if necessary. Other streams, particularly in the southern part of the state, require rehabilitation to recover instream and riparian habitat and conditions for trout. These streams may need the full range of management techniques, including more intensive

and ground-disturbing streambank and in-stream practices. All applicable water permits and/or hydrologic and hydraulic analyses pursuant to NR 116, Wisconsin Administrative Code, must be obtained before work begins.

Ecological Landscape Opportunities

Ecological Landscape	Opportunity*
Central Sand Hills	M
Forest Transition	M
North Central Forest	M
Northeast Sands	M
Northwest Sands	M
Superior Coastal Plain	M
Western Coulee and Ridges	M
Western Prairie	M
Central Sand Plains	I
Northern Highland	I
Southwest Savanna	I
Central Lake Michigan Coastal	P
Northern Lake Michigan Coastal	P
Northwest Lowlands	P
Southeast Glacial Plains	P

M = Major; major opportunity exists in this Landscape; many significant occurrences are recorded, or restorations likely to be successful.

I = Important; several occurrences important to maintaining the community in the state occur in this Landscape.

P = Present; community is present in the Landscape but better opportunity exists elsewhere.

Rare Species

Many Species of Greatest Conservation Need (SGCN) are associated with coldwater streams based on the findings in Wisconsin's 2015 Wildlife Action Plan. To learn more, visit the Aquatic communities page and click on "Coldwater streams" under "Explore aquatic communities".

Threats

- Runoff carrying sediments, nutrients, bacteria, or contaminants from agricultural areas, construction sites, or developed areas, particularly where these occur on or near stream banks, washes into streams, negatively impacting their water quality and associated plant and animal communities.
- Agricultural activities such as row cropping and grazing on or near stream banks destroy stream-side vegetation, cause bank erosion, compaction, and stream widening, and negatively impact water quality.
- Alteration of stream hydrology through installation of dams, other water control structures, channelization, or excessive groundwater withdrawals destroys stream bank and in-stream habitat, disrupts natural hydrologic fluctuations and temperature regimes integral to aquatic ecosystems and associated wetlands, fragments habitat, and prevents movements of some species.

- Altered temperature and precipitation patterns associated with climate change are projected to have significant negative impacts on coldwater streams due to increasing water temperatures and altered flows (either decreases due to higher temperatures and drought or increases from more frequent, higher-intensity precipitation events which lead to flooding). Some streams will likely warm to the point where they can no longer support coldwater species such as trout.

Management Techniques

- Passive management
- Fish passage practices
- In-stream practices
- Pesticide treatments
- Streambank practices

Management Prescriptions

- Wherever possible, manage coldwater streams as part of a complex of interconnected, related habitats (e.g., open, shrub, or forested wetlands, grasslands, upland forests, etc.).
- Maintain site hydrology; restore where appropriate and feasible.
- Where possible, use buffers to protect streams from negative impacts of surrounding land uses (e.g., sedimentation, pollution).
- Assess the condition of riparian and instream habitats and the health of fish populations to determine the type and intensity of management needed.
- Apply primarily passive management to sites that are high-quality and stable.
- Consider site and landscape context when conducting vegetation restoration in riparian corridors, favoring appropriate native species.
- Address fish passage impairments (e.g., beaver dams, culverts) to reconnect stream reaches and to maintain the free-flowing, coldwater environment required to maintain robust populations of aquatic species.
- Consult with Natural Heritage Conservation staff during the planning of in-stream and riparian habitat enhancement projects.
- Attempt to prevent the spread of non-native invasive species into streams where they currently do not occur. Employ chemical and mechanical methods to control them where they are present.
- Consider potential impacts on streams when conducting management in adjacent areas, including impacts on groundwater recharge areas, springs, etc.
- Follow Bureau of Fisheries Management guidance on fish stocking rates.